

## REMARKS

This response to the Office Action of October 6, 2005 is being filed concurrently with a Request for Continued Examination (RCE). Enclosed herewith is the RCE request form, along with the requisite fee. Also enclosed herewith is a Petition for Extension of Time in which to file a response to the Office Action, along with the requisite fee.

Claims 1-43 remain pending in this application for consideration. Applicant notes with appreciation that the examiner has indicated that claims 10, 15, 17, and 31 of the application are allowable if rewritten in independent form. In the present Office Action, the examiner refers back to the Office Action of March 8, 2005 in which she initially rejected claims 1-9, 11-14, 16, 18-30, and 32-43 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,917,798 to *Liou* et al. ("*Liou*"), rejected claims 1, 27-30, 35-37, and 41-43 under 35 U.S.C. § 103(a) as being unpatentable over *Liou* in view of U.S. Patent No. 5,282,964, to *Young* et al. ("*Young*"), and rejected claims 18-23, 24, 28, 32-34, and 38-40 under 35 U.S.C. § 103(a) as being unpatentable over *Liou* in view of *Young*, in further view of U.S. Patent No. 4,961,760 to *Caskey* et al. ("*Caskey*").

Applicant respectfully disagrees with the examiner's rejection, and, pursuant to the concurrently filed RCE, requests that the examiner review the application in view of the following remarks.

### **Rejections Under 35 U.S.C. § 102(b)**

Claims 1-9, 11-14, 16, 18-30, and 32-43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Liou*. In addition, in the present Office Action, the examiner states that "amended claim 1 is broad enough to read in a single bundle of membranes disposed within the housing around a central core or support column" (page 2 of October 6, 2005 Office Action).

Applicant respectfully disagrees. *Liou* discloses a filter cartridge (hollow fiber separator apparatus) in which hollow fiber filtration material is enclosed within a reinforcing element. Beginning with the Abstract of *Liou*, the disclosure states: “[w]herein the set of hollow fibers is subdivided into a plurality of elementary bundles, at least a first end of each elementary fiber is enclosed in a reinforcing element” (emphasis added). This same limitation is repeated in the Summary of the Invention at column 1, lines 46-51 of *Liou*. Furthermore, FIG. 2 of *Liou* shows a bundle of fibers 3 enclosed within reinforcing elements 5, which is further described at column 3, lines 9-13 of *Liou*. Thus, there is no disclosure in *Liou* of a filtration element or cartridge in which filtration members are not enclosed within a support column or reinforcing member. In fact, column 3, lines 19-25 of *Liou* describes that the arrangement of having the fibers enclosed is desired, so that the fluid can “flow freely” in the spaces between the sleeves.

By contrast, independent claims 1, 24, 27, 32, 35, 38, and 41 of the present application all include a limitation requiring that at least one membrane bundle or filtration membrane is not contained within said support column. This is diametrically opposed to the disclosure of *Liou*, where filtration material is only disposed within reinforcing elements. *Liou* does not make any disclosure whatsoever of filtration material disposed outside of the reinforcing elements, as required in claims 1, 24, 27, 32, 35, 38, and 41 of the present application.

Since *Liou* does not disclose every limitation of independent claim 1 of the present application, that claim is not anticipated by *Liou*, and the examiner’s rejection of claim 1 should be withdrawn. Claims 2-23, which depend from claim 1, are thus also allowable. Thus, the examiner’s rejection of claims 2-9, 11-14, 16, and 18-23 is also improper, and should be withdrawn.

**Rejections Under 35 U.S.C. § 103(a)**

**Claims 1, 27-30, 35-37, and 41-43**

The examiner rejected claims 1, 27-30, 35-37, and 41-43 under 35 U.S.C. § 103(a) as being unpatentable over *Liou* in view of U.S. Patent No. 5,282,964, to *Young* et al. (“*Young*”).

As discussed above with respect to the §102 rejections, *Liou* is directed to a filtration cartridge in which the filtration membranes are entirely contained within reinforcing sleeves.

*Young* similarly discloses a filtration cartridge in which, when support columns are present, the filtration membranes are contained entirely within those support columns. As shown in FIG. 1 of *Young*, bundles of hollow fibers 11 are assembled within seven cylindrical tubes 10 into a single module 12 (*see* also column 10, lines 26-40 of *Young*). As shown in FIG. 2 of *Young*, cylindrical tubes 20 containing bundles of hollow fibers are attached between opposite tube sheets 23. Claim 1 of *Young* refers to hollow fiber membrane bundles, “each bundle being contained within a separate and distinct enclosure” (emphasis added). There is, however, absolutely no disclosure in *Young* of a configuration of filtration cartridge having support columns in which filtration material is not disposed within those support columns, as required in all claims of the present application.

The examiner cites FIG. 3 of *Young* as disclosing “disposing modules on support columns or separating bundles by baffles, which define separate columns.” Applicant respectfully disagrees. FIG. 3. of *Young* does not disclose any support columns whatsoever. FIG. 3, as described in Column 10, lines 60-69 of *Young*, shows a configuration in which non-cylindrical bundles 31 are separated by an impermeable material 30 (“baffles”). As shown and

described in *Young*, the “baffles” 30 serve only to separate the non-cylindrical fiber bundles. The baffles, however, are not “support columns” as defined in the specification of the present application, and as that term is commonly used. There are, in fact, no support columns whatsoever described or shown in FIG. 3 of *Young* as required in all of the claims of the present application.

By contrast, independent claims 1, 24, 27, 32, 35, 38, and 41 of the present application all include limitations requiring: (1) at least one support column, and (2) at least one membrane bundle or filtration membrane that is not contained within said support column.

Neither *Liou* nor *Young* disclose a filtration element having support columns in which filtration material is disposed outside of those support columns, as required in each claim of the present application. Since neither *Liou* nor *Young* make such a disclosure, their hypothetical combination likewise makes no such disclosure. Thus, the examiner’s combination of *Liou* and *Young* does not disclose the invention claimed in the present application. As stated in MPEP § 2143.01, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. Neither *Liou* nor *Young*, nor their hypothetical combination, teach, suggest, or disclose a filtration cartridge as claimed in the present application, having support columns, with filtration material disposed outside of the support columns. Furthermore, even if the references were combined, their combination would not yield the invention as claimed in the present application. Thus, the examiner’s rejection of claims 1, 27-30, 35-37, and 41-43 is unsupported by the art and should be withdrawn.

Furthermore, *Liou* states that the fluid “can flow freely in the spaced (sic) between the sleeves”, and that “empty spaces are left” to facilitate fluid flow (*Liou*, column 3, lines 25-

41). Similarly, *Young* states that “[b]ecause the resistance to flow is much smaller in the open region between porous and impermeable sleeves than in the area packed with fibers, the permeating fluid will flow radially outward from the fiber bundles into the open region” (*Young*, column 14, lines 9-13). As stated in MPEP § 2145, it is improper to combine references where the references teach away from their combination. Here, both *Liou* and *Young* teach away from the present invention, in which filtration material is located outside of support columns. Both *Liou* and *Young* cite advantages of not having filtration material located outside of the reinforcing columns. Thus, each teach away from the invention claimed in the present application where filtration material is required outside of the support columns. For this additional reason the examiner’s rejection of claims 1, 27-30, 35-37, and 41-43 is improper, and should be withdrawn.

Claims 18-23, 24, 28, 32-34, and 38-40

The examiner also rejected claims 18-23, 24, 28, 32-34, and 38-40 under 35 U.S.C. § 103(a) as being unpatentable over *Liou* in view of *Young*, in further view of U.S. Patent No. 4,961,760 to *Caskey* et al. (“*Caskey*”). The examiner cites *Caskey* as disclosing a permeate tube through the center of the cartridge that is not disclosed in either *Young* or *Liou*, and that it would have been obvious to combine the teachings of *Young* and *Liou* with the permeate tube disclosed in *Caskey* to arrive at the claimed invention.

As with *Liou* and *Young*, discussed above, *Caskey* does not disclose a filtration element having support columns in which filtration material is disposed outside of those support columns, as required in every claim of the present application. *Caskey* simply discloses a basic filtration cartridge having spiral-wound filtration material, with a permeate tube for removing filtered fluid from the cartridge. Since neither *Liou*, *Young*, nor *Caskey* disclose a filtration

element having support columns, with filtration material disposed outside of those support columns as required in every claim of the present application, their combination does not make such a disclosure.

As stated in MPEP § 2143.01, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. Neither *Liou*, *Young*, or *Caskey*, or their hypothetical combination, teach, suggest, or disclose a filtration cartridge as claimed in the present application, having support columns, with filtration material disposed outside of the support columns. Furthermore, even if the references were combined, their combination would not yield the invention as claimed in the present application. Thus, the examiner's rejection of claims 18-23, 24, 28, 32-34, and 38-40 on this basis is unsupported by the art and should be withdrawn.

In addition, as stated in MPEP § 2143.01, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. There is no suggestion in either *Liou*, *Young*, or *Caskey* that would lead one skilled in the art to combine the axial permeate tube of *Caskey* with the higher-density cartridges of *Liou* and *Young*. In fact, eliminating a center filtration member of either *Liou* or *Young* to replace it with a permeate tube as disclosed in *Caskey* would decrease those cartridge's filtration capability by approximately fourteen (14) percent. Since those skilled in the art are, in fact, looking to increase the filtration capability of a given filtration cartridge, the references actually teach away from their combination. For this additional reason, the examiner's rejection of claims 18-23, 24, 28, 32-34, and 38-40 is improper, and should be withdrawn.

In view of the foregoing remarks, it is respectfully submitted that all claims of the application are now in condition for allowance and eventual issuance. Such action is respectfully requested. Should the Examiner have any further questions or comments which need be addressed in order to obtain allowance, she is invited to contact the undersigned attorney at the number listed below.

Acknowledgement of receipt is respectfully requested.

Respectfully submitted,

By: 

Mark C. Young, Reg. No. 48,670  
STINSON MORRISON HECKER LLP  
1201 Walnut Street, Suite 2800  
Kansas City, MO 64106-2150  
Telephone: (816) 842-8600  
Facsimile: (816) 691-3495  
Attorney for Applicant